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DB Riley LEBS Project

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Abstract

Coal supplies more than half of our nation's electricity. Much of the growth in world energy consumption projected for the next century will be supplied by coal. More stringent regulation of sulfur and NO_x emissions and concern over global warming will require future coal technologies to be much cleaner and more efficient than current technology.

The U.S. Department of Energy (DOE) is sponsoring the Low Emission Boiler Systems (LEBS) program to meet these power and environmental needs. Without significantly departing from traditional pulverized coal-firing design features, this technology will:

- Reduce SO₂ and NO_x emissions to one-sixth of the levels allowed by today's Federal air quality standards.
- Lower emissions of fly ash and other particulates to a third of those allowed by today's standards.
- Produce byproducts, rather than solid waste.
- Improve power-plant efficiency from today's 35% to 42-45%.
- Produce electricity at costs equal to, or less than those of a modern-day coal plant.

DB Riley is leading an industry team to develop a commercial LEBS generating plant that incorporates several unique boiler and environmental control technologies. The DB Riley LEBS design integrates a state-of-the-art supercritical boiler with an advanced low-NO_x U-fired furnace, and a new regenerable copper oxide flue gas treatment process. In addition to controlling air emissions, the U-fired furnace converts nearly all the ash to an inert glass-like slag material, while the copper oxide process converts sulfur dioxide to commercial valuable byproducts. The DB Riley team is now in the final phase of a four-step LEBS program leading to the construction and operation of a LEBS proof-of-concept test facility.